

# MULTI-DIRECTIONAL GRIP SWITCH LAMP SOCKET

## BACKGROUND OF THE INVENTION

### 5 1. Field of the Invention

This invention relates to a multi-directional grip switch lamp socket, particularly to one movable to any direction for turning on and off the switch of a lamp socket, convenient to handle.

### 10 2. Description of the Prior Art

There are three conventional kinds of lamp sockets having different switches classified into a knob switch lamp socket, a pusher switch lamp socket, and a lamp socket with a pull string.

15 The knob switch lamp socket disclosed in the US patent of Serial No. 4936777 includes a switch handle to be rotated for carrying out turning on and off to light up or turn off a lamp. If the switch handle is rotated clockwise for a set angle, the power is through to light  
20 up the lamp, and the power is to be cut off by the same action of rotating the switch handle clockwise for a set angle further. Thus its operable direction is definite.

The pusher switch lamp socket disclosed in the US patent of Serial No. 6010355 includes a handle to be  
25 pulled laterally to turn on and off the power. If the handle is pushed forward, the switch is turned on, and if

the handle is pushed in the reverse direction laterally, the switch is turned off. Thus this pusher switch lamp socket is also operable in the definite direction only.

The lamp socket with a pull string disclosed in the  
5 US patent of Serial No. 6186822 includes a long string for controlling a switch positioned in the lamp socket. A first pulling of the string can turn on the switch, and a second pulling of the string can turn off the switch. So this lamp socket with a pull string can carry out turning  
10 on and off by only repeating pulling down the string.

Those three conventional switch lamp sockets all have a definite set direction for turning on and off the switch, so they are not so convenient for users (or consumers), if users do not know their operable  
15 direction beforehand.

#### SUMMARY OF THE INVENTION

This invention has been devised to offer a multi-directional grip switch lamp socket, convenient for handling.

#### 20 BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of a multi-directional grip switch lamp socket in the present  
25 invention;

Figure 2 is a perspective view of a rotating member

in the present invention;

Figure 3 is an upper view of the multi-directional grip switch lamp socket in the present invention;

Figure 4 is a cross-sectional view in the direction  
5 of the arrowhead marked A in Fig. 3;

Figure 5 is a cross-sectional view in the direction of the arrowhead marked B in Fig. 3;

Figure 6 is a cross-sectional view of the multi-directional grip switch lamp socket moved in the A  
10 direction shown in Fig. 3; and,

Figure 7 is a cross-sectional view of the multi-directional grip switch lamp socket moved in the B direction shown in Fig. 3;

#### DETAILED DESCRIPTION OF THE PREFERRED 15 EMBODIMENT

A preferred embodiment of a multi-directional grip switch lamp socket in the present invention, as shown in Fig. 1, includes an insulating body 1, a metal lamp socket 17 and an insulating disc positioned between the  
20 insulating body 1 and the lamp socket 17.

The insulating body 1 is made of insulating material such as bakelite, having an interior hollow opening to the bottom, two wire holes 19, 23 for two wires 18, 22 to insert therein, and two terminals 3, 4 to  
25 be placed in the hollow of the insulating body 1 to face the two wire holes 19, 23 to connect with the two wires

18, 22.

Further, a rotatable member 11 is positioned in the interior hollow of the insulating body 1, made of insulating material, having a large ratchet 28 rotatably fixed on one side and a small ratchet 32 on the other side in a corresponding way, as shown in Fig. 2, a projecting shaft 111 extending from the center of the rotatable member 11 to its both sides and fitting in an inner hole (not shown) in the interior hollow to let the rotatable member 11 to rotate freely with the projecting shaft 111. The large ratchet 28 and the small ratchet 32 both made of insulating material have even numbers (eight shown in Figures for example in the invention) of ratchet teeth, and further a metal conductor 10 is provided to fit around the outer circumference of the large ratchet 28, having the half number (four shown in an example) of contact pieces 101 spaced apart equidistantly in its outer circumference as that of the ratchet teeth of the large ratchet 28. The large ratchet 28 has their ratchet teeth spaced apart and intermittently covered by the contact pieces 101.

The terminal 4 has its connect end 21 bored with a hole 211 for a rivet 212 to fit through to firmly connect the terminal 4 with the lamp socket 17.

Further, a intermediate contact member 14 is provided under the large ratchet 28 of the rotatable

member 11, passing through a hole of the insulating disc 5 to reach the interior of the lamp socket to contact with a terminal of the lamp (not shown), and having an elastically pressing plate 29 bent toward the large ratchet 28 and elastically contact on either one of the ratchet teeth of the large ratchet 28 or one of the contact pieces 1101 of the conducting member 10.

The terminal 3 also has an elastically pressing plate 27 bent toward the large ratchet 28 and elastically urging on either one of the ratchet teeth of the large ratchet 28 or one of the contact pieces 101 of the conductive member 10. Further, the terminal 3 has a projection 25 for a connect hole 26 of the elastically pressing plate 27 to fit with, letting the terminal 3, the intermediate contact member 14 and the large ratchet 28 electrically communicating with one another

Further, a hooking member 9 is provided, positioned in the interior hollow of the insulating body 1, having an front end hooking one of the teeth of the small ratchet 32, and a through hole 30 for a T-shaped rod 2 to pass through. The T-shaped rod 2 has a hook hole 31 formed in its end.

Further, a switch grip 6 is provided, positioned outside of the insulating body 1, and a hook 7 is secured in the switch grip 6 with a pin 6, so the pull rod 2 orderly passes through the through hole of the hooking

member 9, a spring 15, a fix base 12 and a guide ring 16, with the hook 7 hooking the hook hole 31 of the pulling rod 2. Then the switch grip 6 can pull the hooking member 9 to move laterally. The spring 15 is firmly secured in the fix base 12, having two ends respectively urging the hooking member 9 and the guide ring 16. The guide ring 16 has a recessed surface 161 for the inner end of the switch grip 6 to fit therein.

In assembling, as shown in Figs. 3, 4 and 5, the wires 18, 22 are inserted in the interior of the insulating body 1, contacting the connect ends 24, 20 of the terminals 3, 4, letting electric current to flow through the wire 18 to the terminal 4 and then to the lamp socket 1 and through the wire 22 to the elastic pressing plate 27 of the terminal 3. As the terminal 3 and the intermediate contact member 14 have their elastic pressing plates 29, 27 respectively urging the teeth of the large ratchet 28 made of insulating material, as shown in Fig. 4, so the terminal 3 is not in the through condition with the intermediate contact member 14, with the current of the wire 22 cannot reach the intermediate contact member 14. Then at the other side of the rotatable member 11, as shown in Fig. 5, the hooking member 9 does not hook the teeth of the small ratchet 32 owing to elastic push of the spring 15.

In handling, as shown in Figs. 6 and 7, a user only

pulls the switch grip 6 outward, or bend or incline the switch grip 6 to any direction (to force the switch grip 6 incline with the end of the guide ring 16 as a fulcrum), then the hook 7 may pull the pulling rod 2, which then  
5 moves the hooking member 9 laterally toward the grip 6. When the hooking member 9 moves outward, it will press the spring 15 in the fix base 12 to shrink, and the hooking member 9 also hooks and rotates the teeth of the small ratchet 32 for a set angle or the width of the  
10 ratchet tooth, or an eighth of 360 degrees (or 45degrees). Thus if a user releases the grip 6, the spring 15 recovers its elasticity to lengthen out, pushing the hooking member 9 to retreat back to the position shown in Fig. 4, and also passing over a next tooth of the small ratchet  
15 32.

Next, as shown in Fig. 6 and 7, the large ratchet 28 also rotates for the set angle (or the width of its one tooth) at the same time when the small ratchet 32 rotates for the set angle. Therefore, the two elastic pressing  
20 plates 29, 27 of the intermediate contact member 14 and the terminal 3 both contact the contact strips 101 of the conductive member 10, letting the terminal 3 and the center contact member 14 electrically connected with each other, with electric current flowing through the  
25 terminal 3, the elastic pressing plate 27, the contact strip 101, the elastic pressing plate 29 and the

intermediate contact member 14 to a lamp (not shown), which is then lit up. According to the design described above, whenever a user pulls or bends (inclines) the grip 6 once, the hooking member 9 rotates synchronously the small ratchet 32 and the large ratchet 28 for the set angle once, connecting electrically the contact strips 101 of the conducting member 10 with the terminal 3 and the intermediate contact member 14, or disconnect electrically by making the terminal 3 and the intermediate contact member 14 directly contact the insulated teeth of the large ratchet 28.

While the preferred embodiment of the invention has been described above, it will be recognized and understood that various modifications may be made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.